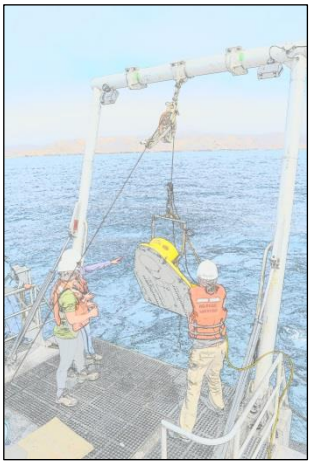


Post Survey

Field Operations and Compliance Report

Geophysical Survey Permit PRC 9307

Northern Channel Islands

June 6-10, 2016

Prepared June 29, 2016 by
Jillian Maloney, San Diego State University
and
Greg Sanders, Bureau of Ocean Energy Management

The following information is provided pursuant to the California State Lands Commission (CSLC) Geophysical Survey Permit PRC 9307, section 9a.

SURVEY INFORMATION

1. Description of Work Performed

   Geophysical surveys were conducted from the Channel Islands National Marine Sanctuary vessel, R/V *Shearwater*, beginning on June 6, 2016 and ending on June 10, 2016. The vessel departed from Santa Barbara Harbor daily at 0630 and returned to the harbor by 1800. Transit time from the harbor to survey location varied between ~90-140 minutes each way. Survey areas were located around Santa Rosa and Santa Cruz Islands (see maps and survey coordinates in subsequent sections of this report).

   The geophysical instruments used during this survey included a Klein 3000H sidescan sonar operated at 455 kHz and an Edgetech 512 sub-bottom profiler operated at 1-15 kHz. Both instruments were deployed from the stern of the vessel and were operated simultaneously for the duration of data collection.

   A total of 65 survey lines, covering ~190 km, were run during this effort. The sidescan sonar data recorded seafloor characteristics, while the sub-bottom profiler imaged sediments beneath the seafloor to depths of ~40 m below seafloor. Data quality from both instruments was good.

2. Weather and Sea State During Operations

   Weather and sea state varied slightly during operations. Each morning the skies were overcast occasionally clearing to partly cloudy skies in the afternoon. Wind varied from calm to 15 knots (typically out of the Northwest) and swell ranged from 0 - 1m depending on the location. Visibility was good to excellent. Fog was sometimes visible in the distance but never enveloped the vessel during operations.

   Sun glare, white-capping, fog, and rough seas were not factors during this survey effort.

3. Survey Area Maps

The following figures are maps showing the track lines for each day of the survey and the overall survey effort:

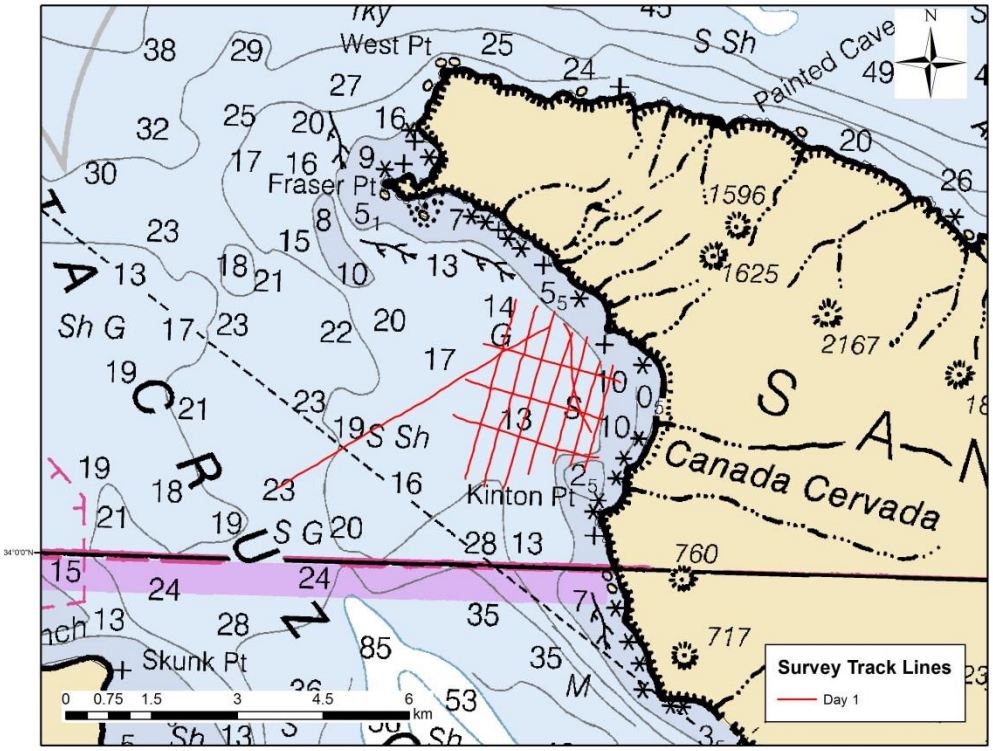


Figure 1: Survey Track Lines, June 6, 2016. West end Santa Cruz Island

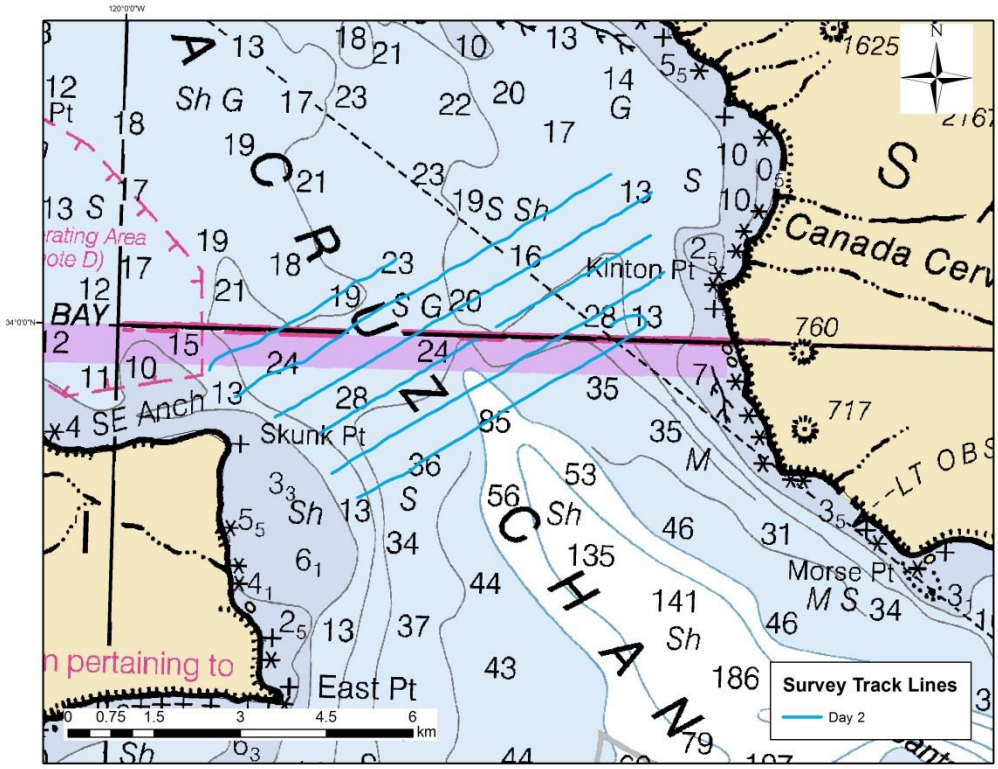


Figure 2: Survey Track Lines, June 7, 2016. Channel between Santa Rosa and Santa Cruz Islands

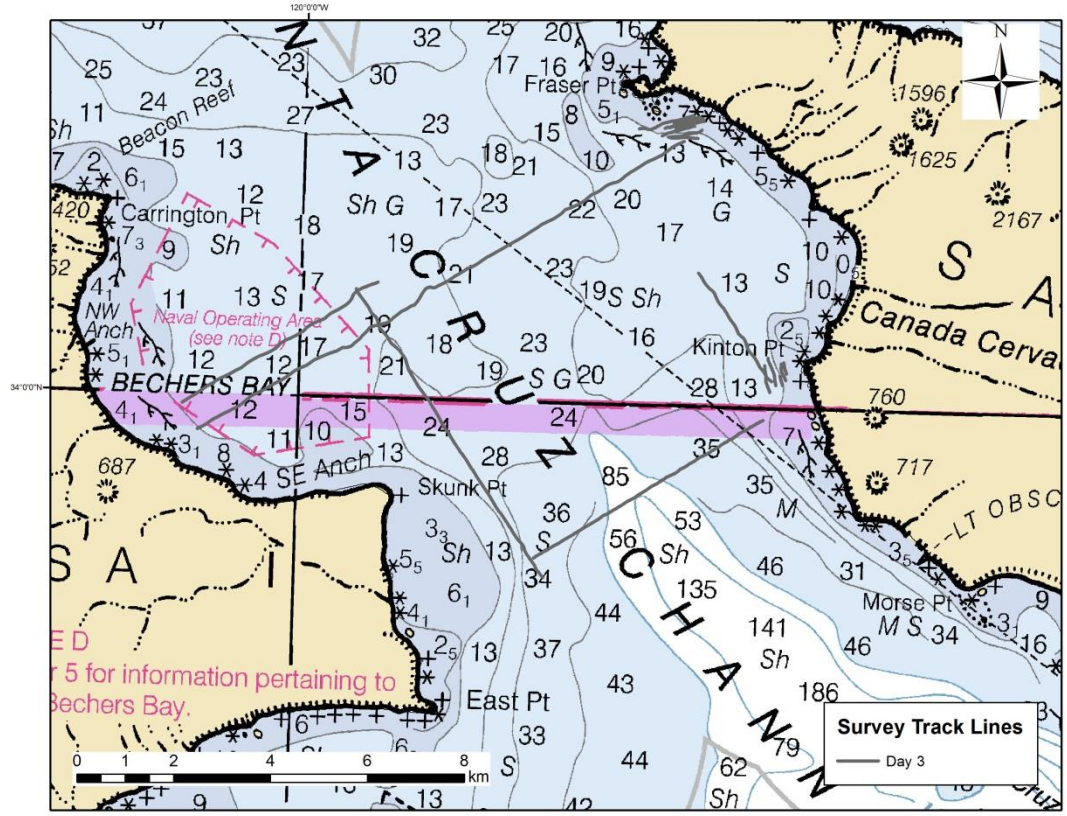


Figure 3: Survey Track Lines, June 8, 2016. Nearshore areas of west Santa Cruz Island and Channel between Santa Rosa and Santa Cruz Islands

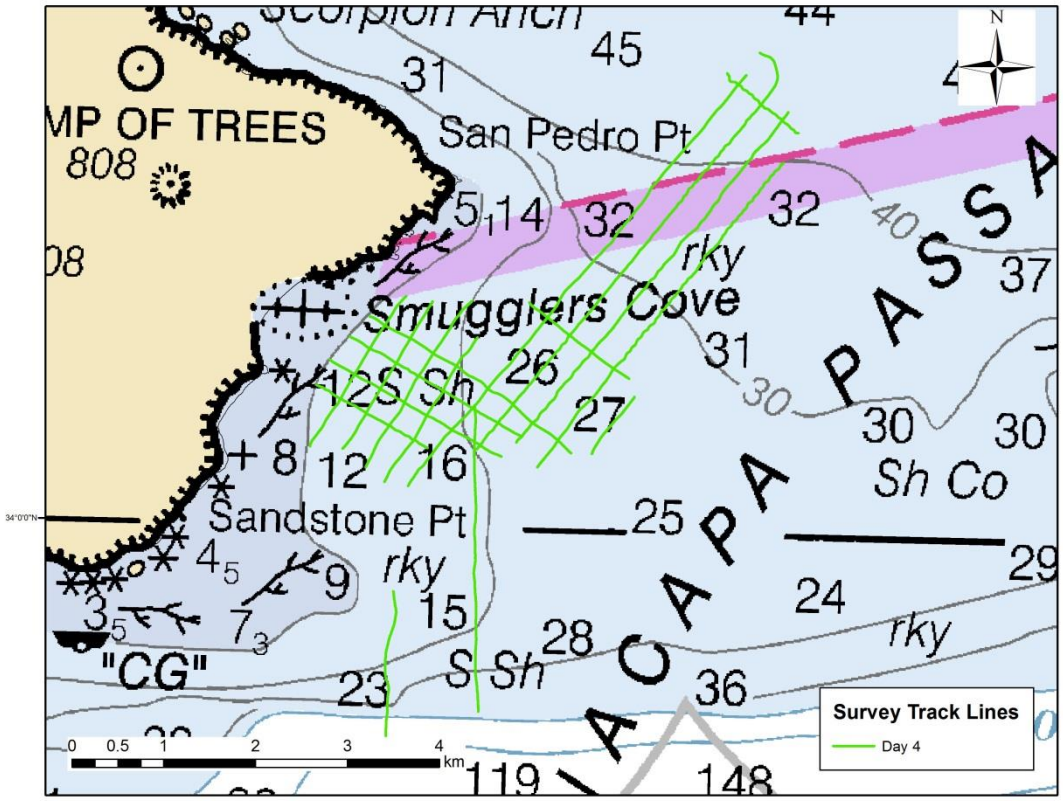


Figure 4: Survey Track Lines, June 9, 2016, East End of Santa Cruz Island

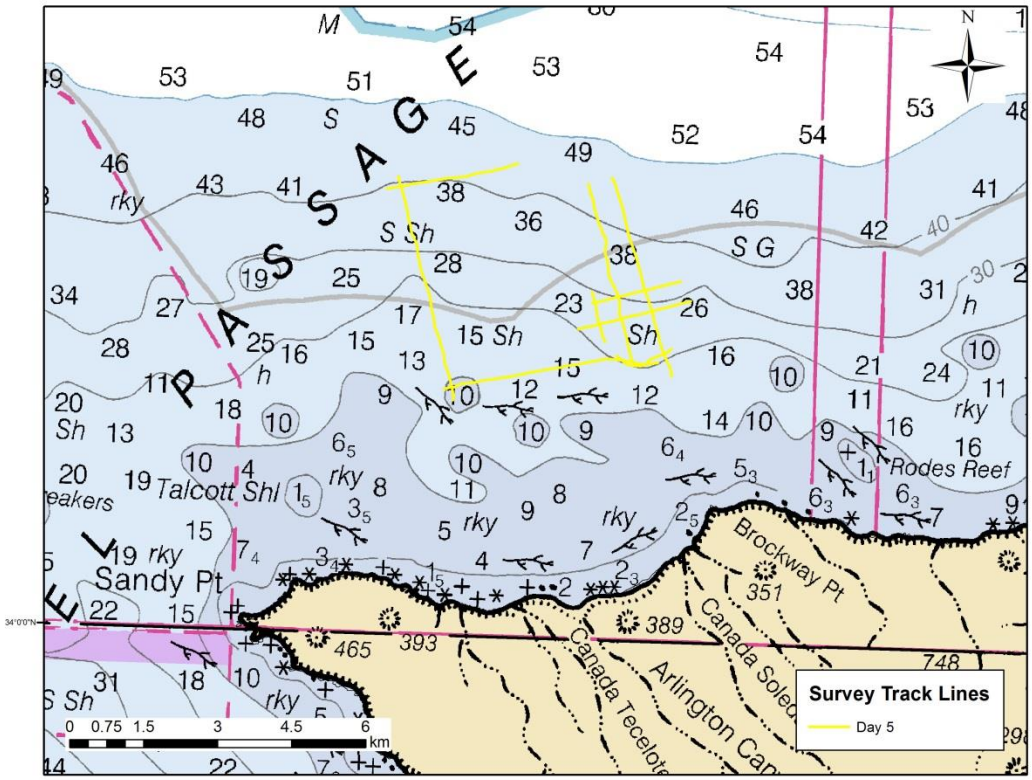


Figure 5: Survey Track Lines, June 10, 2016, Northwest side of Santa Rosa Island

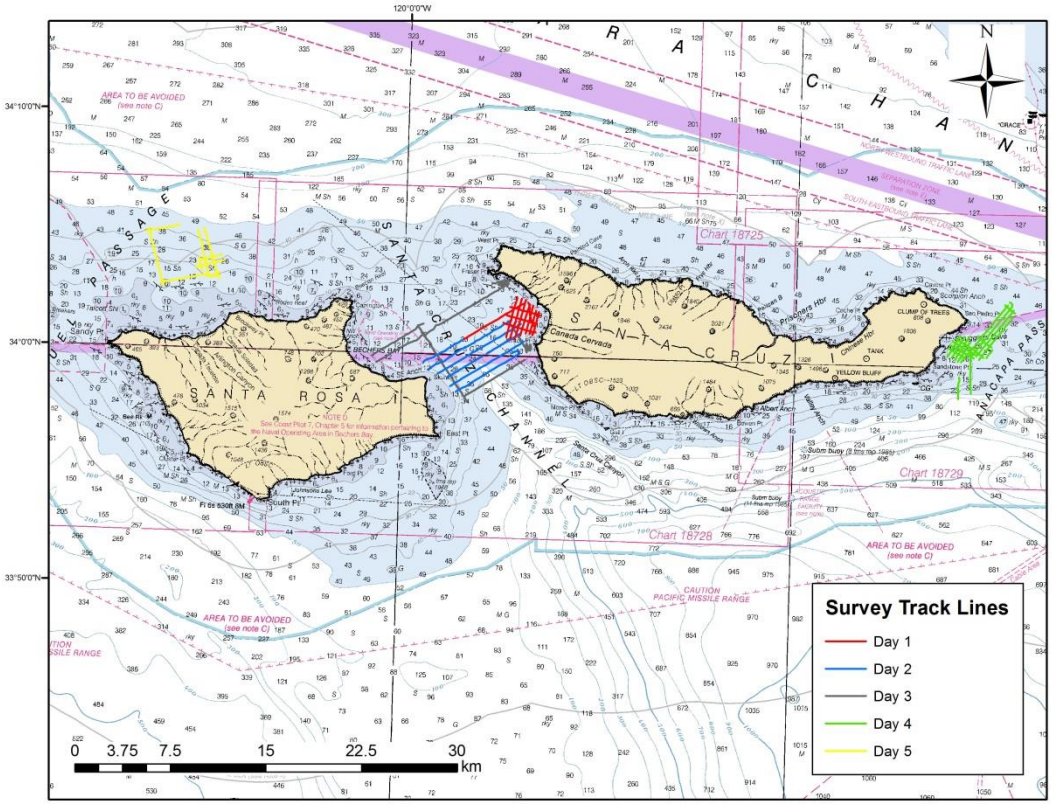


Figure 6: Survey Track Lines, Overall effort June 6-10, 2016, Northern Channel Islands

4. Survey Track Line Coordinates

Table 1 provides latitude and longitude coordinates for each survey line conducted during the survey effort.

Table 1: Survey Track Line Coordinates

Line #	Start Latitude	Start Longitude	End Latitude	End Longitude	Length (km)
Day 1					
1	34.015433	-119.890168	34.032007	-119.885138	1.997
2	34.032547	-119.887467	34.016023	-119.892642	2.007
3	34.016373	-119.895913	34.036340	-119.890152	2.382
4	34.036942	-119.893000	34.014522	-119.900553	2.742
5	34.012072	-119.905322	34.040225	-119.896418	3.401
6	34.040987	-119.899707	34.012410	-119.908837	3.481
7	34.013505	-119.912368	34.041943	-119.903792	3.464
8	34.034825	-119.909683	34.029353	-119.883625	2.510
9	34.023575	-119.886930	34.029145	-119.912873	2.532
10	34.023578	-119.915005	34.017488	-119.887337	2.689
11	34.021427	-119.888883	34.038308	-119.894580	2.104
12	34.037930	-119.897118	34.011247	-119.947850	5.674
Day 2					
1	34.011640	-119.947867	33.993313	-119.982405	3.917
2	33.989257	-119.977392	34.025752	-119.907925	7.762
3	34.023132	-119.900195	33.986225	-119.969823	7.815
4	33.983923	-119.961312	33.999343	-119.932242	3.271
4.1	34.001387	-119.928662	34.016353	-119.900097	3.210
5	34.010688	-119.897395	33.977680	-119.958820	6.922
6	33.974043	-119.953823	34.002132	-119.907112	6.932
Day 3					
1	34.050052	-119.920230	34.051997	-119.912938	0.723
2	34.051248	-119.925357	34.053983	-119.913150	1.207
3	34.051485	-119.919645	34.053095	-119.913020	0.649
4	34.052473	-119.917577	34.053763	-119.911800	0.562
4.1	34.051398	-119.911327	34.049848	-119.918830	0.731
6	34.051663	-119.918488	34.053417	-119.911100	0.717
7	34.049800	-119.912142	34.049718	-119.918277	0.571
8	34.051582	-119.917203	34.052957	-119.910953	0.605
9	34.049153	-119.915250	33.996723	-120.015005	11.290
9.1	33.996712	-120.015038	33.993192	-120.022217	0.784

10	33.997985	-120.025763	34.021382	-119.982763	4.988
11	34.020032	-119.987580	33.967285	-119.944058	7.368
12	33.970927	-119.946320	33.997733	-119.895833	5.810
13	34.006058	-119.892398	34.004288	-119.891747	0.215
14	34.002937	-119.894547	34.007922	-119.895848	0.621
14.1	34.051398	-119.911327	34.049848	-119.918830	0.731
16	34.008312	-119.892203	34.005187	-119.891032	0.387
17	34.004232	-119.893245	34.009350	-119.895133	0.649
18	34.008577	-119.891650	34.006460	-119.890950	0.254
19	34.004975	-119.894205	34.024767	-119.911230	2.827
Day 4					
1	34.018745	-119.517822	34.004353	-119.528368	1.950
2	34.004012	-119.525585	34.045120	-119.486930	5.936
3	34.041600	-119.481868	34.008532	-119.512972	4.777
4	34.009200	-119.512450	34.018530	-119.532877	2.196
5	34.020543	-119.530598	34.007617	-119.506493	2.719
6	34.007603	-119.504035	34.013285	-119.499168	0.793
7	34.015063	-119.499868	34.022293	-119.511832	1.395
8	34.022313	-119.518570	34.005725	-119.530630	2.210
9	34.007502	-119.533382	34.022172	-119.523208	1.896
9.1	34.022632	-119.526350	34.007665	-119.537222	2.011
11	33.993618	-119.527002	33.978072	-119.527473	1.791
12	33.982035	-119.516667	34.012072	-119.517985	3.399
13	34.007117	-119.514680	34.016193	-119.535138	2.173
14	34.013715	-119.536653	34.007767	-119.523388	1.423
15	34.007738	-119.517675	34.047338	-119.485400	5.732
16	34.045287	-119.489175	34.039547	-119.480615	1.099
17	34.036580	-119.482323	34.006135	-119.510432	4.422
Day 5					
1	34.086392	-120.192252	34.081070	-120.220848	2.778
2	34.083410	-120.218472	34.042887	-120.204898	4.824
3	34.044877	-120.207030	34.050862	-120.160237	4.517
4	34.050472	-120.165202	34.083153	-120.176740	4.031
5	34.084353	-120.171582	34.048448	-120.157193	4.323
6	34.053445	-120.157405	34.051915	-120.169448	1.300
7	34.054390	-120.171988	34.063435	-120.175195	1.091
8	34.061413	-120.175032	34.065823	-120.155762	1.859
9	34.062283	-120.153417	34.056538	-120.178010	2.392

5. Dates and Times that Data Were Collected
   Geophysical survey data were collected continuously over the following dates and times:

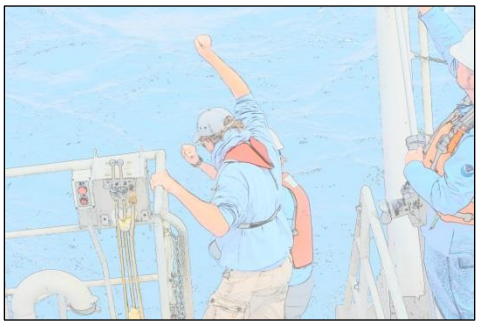
   June 6, 2016: 1015-1542 hrs

   June 7, 2016: 0906-1448 hrs

   June 8, 2016: 0834-1543 hrs

   June 9, 2016: 0836-1448 hrs

   June 10, 2016: 0904-1302 hrs



6. Environmental Hazards Encountered
   On some of the nearshore portions of the survey, kelp (Macrocystis pyrifera) was observed on the surface and survey lines were cut short to avoid entangling survey gear or damaging kelp. Similarly, in some areas fishing buoys (crab pots) were encountered and course deviations were made to avoid entangling survey gear or damaging fishing gear.

7. Accident, Injury, Damage or Loss of Property
   There were no accidents, injuries, damage to or loss of property during this survey effort.

8. Other Information Requested by CSLC
   Please contact Jillian Maloney (San Diego State University) at (619) 594-6394 or David Ball (Bureau of Ocean Energy Management) at (805) 384-6340 if any additional information is needed.

BIOLOGICAL INFORMATION

1. Description of Marine Mammal, Reptile, and Bird Encounters
   Table 2 provides a list of marine mammals observed during transit and/or during survey operations. By far, the most commonly observed marine mammal was the California sea lion (*Zalophus californianus*). Sea lions were observed during transit and in many of the survey areas. Common dolphins (*Delphinus sp*.) were also seen in large numbers (pod size from tens to hundreds of animals) during transits to and from the islands. Large whales (primarily humpback whales) were frequently seen during transit but none were observed in the areas where geophysical surveys were being conducted. Five bottle-nosed dolphins (*Tursiops truncates*) approached the vessel during survey operations off the east end of Santa Cruz Island resulting of a brief shut down of the geophysical equipment (see details of this encounter in the shut down section of this report).

Sea turtles are rarely seen in the Santa Barbara Channel and the northern Channel Islands. No sea turtles were observed, either in transit or during survey operations.

Seabirds were observed frequently during transit and during survey operations. On June 9, large feeding aggregations of western gulls (*Larus occidentalis*) and brown pelicans (*Pelecanus occidentalis*) were observed in a line along the northern edge of the survey area off the east end of Santa Cruz Island. They were apparently feeding on small (less than 5cm) schooling fish and pelagic red crabs (*Pleuroncodes planipes*). Interestingly, no marine mammals were associated with these feeding aggregations. Also on June 9, a bald eagle (*Haliaeetus leucocephalis*) was observed foraging in the survey area. It captured a fish and took it to a bluff on the shore of the island for consumption.

Feeding gulls and pelicans

Although not a marine mammal, reptile or bird, it is worth noting that on June 9, 2016, three basking sharks (*Cetorhinus maximus*) were sighting in the Santa Barbara channel while transiting back from the survey area. Photos and a description of the sighting were forwarded to the National Marine Fisheries Service's basking shark web site/hotline. Several ocean sunfish (*Mola mola*) were also observed during transit on multiple days.

Table 2: Marine Mammals Observed During Transit and/or During Survey Data Collection, June 6-10, 2016

Species	Transit or Survey	Frequency of Observation
California Sea Lion (*Zalophus californianus*)	Transit and Survey	Multiple sightings/multiple days
Common Dolphin (*Delphinus sp*.)	Transit	Multiple sightings/multiple days
Humpback Whale (*Megatera novaengliae*)	Transit	Multiple sightings/multiple days
Minke Whale (*Balaenoptera acutorostrata*)	Transit	One sighting(1 individual, 06/8/16)
Pacific White-sided Dolphin (*Lagenorhynchus obliquidens*)	Transit	One sighting (2 individuals, 06/10/16)
Dall's Porpoise (*Phocoenoides dalli*)	Transit	Two sightings (15 individuals, 06/06/16) (2 individuals, 06/10/16)
Bottle-Nosed Dolphin (*Tursiops truncates*)	Survey	One sighting (11+ individuals, 06/09/16) 5 individuals broke from the pod to investigate the survey vessel.

2. Description of Shut Downs or Slow Downs

Over the survey period, the survey equipment was shut down two times:

June 7, 2016, 1228 hrs – A tight group of approximately 20 California sea lions swam across the path of the survey vessel and along the port side of the vessel. The animals looked closely at the vessel but otherwise did not appear to alter their behavior and continued to swim in a tight group in the same direction that they were heading. The sub-bottom profiler was shut down until they passed out of the exclusion zone. Shortly thereafter, the sub-bottom profiler was started at 10 percent power and ramped up to continue the survey.

June 9, 2016, 12:30 hrs – A group of five bottle-nosed dolphins approached the stern of the survey vessel. Both the side-scan sonar and sub-bottom profilers were turned off as they approached. The dolphins were clearly interested in the side-scan sonar towfish, swimming with the towfish and matching its speed. They did not appear to want to leave. The survey vessel was slowed to a near stop before the dolphins lost interest and swam in the direction of another group (6+) of bottle-nosed dolphins in the distance. When the dolphins were more than 300 m away, the survey vessel was brought back to survey speed, the side-scan sonar was powered up and the sub-bottom profiler was started at 10 percent power and ramped up to continue the survey.

Bottle-nosed dolphins over towfish

The captain slowed the vessel on a few occasions, during transit back and forth from the survey areas, to ascertain the location and direction of distant humpback whales and readjusted course as needed to avoid close approaches of whales.

3. Observations of Pinnipeds at Haul-Out Sites

A few sea lions and northern elephant seals (*Mirounga angustirostris*) were seen on beaches near survey areas. None of these beaches were significant haul out sites and none of the animals were observed to move from their resting areas at any point during the survey.

4. Collision Events

There were no collision events during this survey effort.

5. Implementation and Compliance Verification

See completed copy of the Mitigation Monitoring Plan attached.

6. Marine Wildlife Monitor Evaluation of Mitigation Measures Performed

The R/V Shearwater was an excellent platform for marine wildlife monitoring. Its twin-hull design provided a stable viewing platform and the upper deck allowed for 360 degree views of the operation. The captain and survey crew were exceptionally responsive during the entire survey effort and specifically during the two shut-down events. They also remained vigilant and greatly supplemented the observation effort when surveys were underway.

As noted earlier, California sea lions were the most commonly observed marine mammal in the survey areas. Individual animals were often not detected until they were very close to or within the designated 100m exclusion zone and then they passed through the periphery of the zone very quickly making a shut down of the sub-bottom impracticable. The sea lions appeared to be influenced more by the visual presence of the vessel rather than the sound produced by the geophysical equipment. They would often be craning their head for a better look at the vessel, consistent with the typical reactions displayed when they encounter vessels that are not using geophysical equipment.

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
Air Quality and Greenhouse Gas (GHG) Emissions (MND Section 3.3.3)						
MM AIR-1: Engine Tuning, Engine Certification, and Fuels. The following measures will be required to be implemented by all Permittees under the Offshore Geophysical Permit Program (OGPP), as applicable depending on the county offshore which a survey is being conducted. Pursuant to section 93118.5 of CARB's Airborne Toxic Control Measures, the Tier 2 engine requirement applies only to diesel-fueled vessels.	All Counties: Maintain all construction equipment in proper tune according to manufacturers' specifications; fuel all off-road and portable diesel-powered equipment with California Air Resources Board (CARB)-certified motor vehicle diesel fuel limiting sulfur content to 15 parts per million or less (CARB Diesel).	Daily emissions of criteria pollutants during survey activities are minimized.	Determine engine certification of vessel engines. Review engine emissions data to assess compliance, determine if changes in tuning or fuel are required.	OGPP permit holder and contract vessel operator; California State Lands Commission (CSLC) review of Final Monitoring Report.	Prior to, during, and after survey activities. Submit Final Monitoring Report after completion of survey activities.	5/16/2016
	Los Angeles and Orange Counties: Use vessel engines meeting CARB's Tier 2-certified engines or cleaner; the survey shall be operated such that daily NO_x emissions do not exceed 100 pounds based on engine certification emission factors. This can be accomplished with Tier 2 engines if daily fuel use is 585 gallons or less, and with Tier 3 engines if daily fuel use is 935 gallons or less.		Verify that Tier 2 or cleaner engines are being used. Calculate daily NO_x emissions to verify compliance with limitations.			NA
	San Luis Obispo County: Use vessel engines meeting CARB's Tier 2-certified engines or cleaner, accomplished with Tier 2 engines if daily fuel use is 585 gallons or less; all diesel equipment shall not idle for more than 5 minutes; engine use needed to maintain position in the water is not considered idling; diesel idling within 300 meters (1,000 feet) of sensitive receptors is not permitted; use alternatively fueled construction equipment on site where feasible, such as compressed natural gas, liquefied natural gas, propane or biodiesel.		Verify that Tier 2 or cleaner engines are being used. Inform vessel operator(s) of idling limitation. Investigate availability of alternative fuels.			NA
	Santa Barbara County: Use vessel engines meeting CARB's Tier 2-certified engines or cleaner, accomplished with Tier 2 engines if daily fuel use is 790 gallons or less.		Verify that Tier 2 or cleaner engines are being used. Investigate availability of alternative fuels.			5/16/2016
	Ventura County: Use alternatively fueled construction equipment on site where feasible, such as compressed natural gas, liquefied natural gas, propane or biodiesel.		Investigate availability of alternative fuels.			NA

EXHIBIT H

Mitigation Monitoring Program

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
MM BIO-1: Marine Mammal and Sea Turtle Presence – Current Information.	All State waters; prior to commencement of survey operations, the geophysical operator shall: (1) contact the National Oceanic and Atmospheric Administration Long Beach office staff and local whale-watching operations and shall acquire information on the current composition and relative abundance of marine wildlife offshore, and (2) convey sightings data to the vessel operator and crew, survey party chief, and onboard Marine Wildlife Monitors (MWMs) prior to departure. This information will aid the MWMs by providing data on the approximate number and types of organisms that may be in the area.	No adverse effects to marine mammals or sea turtles due to survey activities are observed.	Document contact with appropriate sources. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder; Inquiry to NOAA and local whale watching operators.	Prior to survey.	5/11/2016
MM BIO-2: Marine Wildlife Monitors (MWMs).	Except as provided in section 7(h) of the General Permit, a minimum of two (2) qualified MWMs who are experienced in marine wildlife observations shall be onboard the survey vessel throughout both transit and data collection activities. The specific monitoring, observation, and data collection responsibilities shall be identified in the Marine Wildlife Contingency Plan required as part of all Offshore Geophysical Permit Program permits. Qualifications of proposed MWMs shall be submitted to the National Oceanic and Atmospheric Administration (NOAA) and CSLC at least twenty-one (21) days in advance of the survey for their approval by the agencies. Survey operations shall not commence until the CSLC approves the MWMs.	Competent and professional monitoring or marine mammals and sea turtles; compliance with established monitoring policies.	Document contact with and approval by appropriate agencies. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Prior to survey.	5/16/2016
MM BIO-3: Safety Zone Monitoring.	Onboard Marine Wildlife Monitors (MWMs) responsible for observations during vessel transit shall be responsible for monitoring during the survey equipment operations. All visual monitoring shall occur from the highest practical vantage point aboard the survey vessel; binoculars shall be used to observe the surrounding area, as appropriate. The MWMs will survey an area (i.e., safety or exclusion zone) based on the equipment used, centered on the sound source (i.e., vessel, towfish), throughout time that the survey equipment is operating. Safety zone radial distances, by equipment type, include:	No adverse effects to marine mammals or sea turtles due to survey activities are observed; compliance with established safety zones.	Compliance with permit requirements (observers); compliance with established safety zones. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Prior to survey.	6/6-10/2016

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
	<table><tr><th>Equipment Type</th><th>Safety Zone (radius, m)</th></tr><tr><td>Single Beam Echosounder</td><td>50</td></tr><tr><td>Multibeam Echosounder</td><td>500</td></tr><tr><td>Side-Scan Sonar</td><td>600</td></tr><tr><td>Subbottom Profiler</td><td>100</td></tr><tr><td>Boomer System</td><td>100</td></tr></table> If the geophysical survey equipment is operated at or above a frequency of 200 kilohertz (kHz), safety zone monitoring and enforcement is not required; however, if geophysical survey equipment operated at a frequency at or above 200 kHz is used simultaneously with geophysical survey equipment less than 200 kHz, then the safety zone for the equipment less than 200 kHz must be monitored. The onboard MWMs shall have authority to stop operations if a mammal or turtle is observed within the specified safety zone and may be negatively affected by survey activities. The MWMs shall also have authority to recommend continuation (or cessation) of operations during periods of limited visibility (i.e., fog, rain) based on the observed abundance of marine wildlife. Periodic reevaluation of weather conditions and reassessment of the continuation/cessation recommendation shall be completed by the onboard MWMs. During operations, if an animal's actions are observed to be irregular, the monitor shall have authority to recommend that equipment be shut down until the animal moves further away from the sound source. If irregular behavior is observed, the equipment shall be shut-off and will be restarted and ramped-up to full power, as applicable, or will not be started until the animal(s) is/are outside of the safety zone or have not been observed for 15 minutes. For nearshore survey operations utilizing vessels that lack the personnel capacity to hold two (2) MWMs aboard during survey operations, at least twenty-one (21) days prior to the commencement of survey activities, the Permittee may petition the CSLC to conduct survey operations with one (1) MWM aboard. The CSLC will consider such authorization on a case-by-case basis and					Subbottom Profiler 100 m radius 6/6-10/2016 MJP

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
	factors the CSLC will consider will include the timing, type, and location of the survey, the size of the vessel, and the availability of alternate vessels for conducting the proposed survey. CSLC authorizations under this subsection will be limited to individual surveys and under any such authorization; the Permittee shall update the MWCP to reflect how survey operations will occur under the authorization.					
MM BIO-4: Limits on Nighttime OGPP Surveys.	All State waters; nighttime survey operations are prohibited under the OGPP, except as provided below. The CSLC will consider the use of single beam echosounders and passive equipment types at night on a case-by-case basis, taking into consideration the equipment specifications, location, timing, and duration of survey activity.	No adverse effects to marine mammals or sea turtles due to survey activities are observed.	Presurvey request for nighttime operations, including equipment specifications and proposed use schedule. Document equipment use. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Approval required before survey is initiated. Monitoring Report following comple-tion of survey.	6/6-10/2016 MJS
MM BIO-5: Soft Start.	All State waters; the survey operator shall use a "soft start" technique at the beginning of survey activities each day (or following a shut down) to allow any marine mammal that may be in the immediate area to leave before the sound sources reach full energy. Surveys shall not commence at nighttime or when the safety zone cannot be effectively monitored. Operators shall initiate each piece of equipment at the lowest practical sound level, increasing output in such a manner as to increase in steps not exceeding approximately 6 decibels (dB) per 5-minute period. During ramp-up, the Marine Wildlife Monitors (MWMs) shall monitor the safety zone. If marine mammals are sighted within or about to enter the safety zone, a power-down or shut down shall be implemented as though the equipment was operating at full power. Initiation of ramp-up procedures from shut down requires that the MWMs be able to visually observe the full safety zone.	No adverse effects to marine mammals or sea turtles due to survey activities are observed.	Compliance with permit requirements (observers); compliance with safe start procedures. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Imme-diately prior to survey.	6/6-10/2016 MJS Final Report attached

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
MM BIO-6: Practical Limitations on Equipment Use and Adherence to Equipment Manufacturer's Routine Maintenance Schedule.	All State waters; geophysical operators shall follow, to the maximum extent possible, the guidelines of Zykov (2013) as they pertain to the use of subbottom profilers and side-scan sonar, including: • Using the highest frequency band possible for the subbottom profiler; • Using the shortest possible pulse length; and • Lowering the pulse rate (pings per second) as much as feasible. Geophysical operators shall consider the potential applicability of these measures to other equipment types (e.g., boomer). Permit holders will conduct routine inspection and maintenance of acoustic-generating equipment to ensure that low energy geophysical equipment used during permitted survey activities remains in proper working order and within manufacturer's equipment specifications. Verification of the date and occurrence of such equipment inspection and maintenance shall be provided in the required presurvey notification to CSLC.	No adverse effects to marine mammals or sea turtles due to survey activities are observed.	Document initial and during survey equipment settings. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Imme-diately prior to and during survey.	6/6-10/2014
MM BIO-7: Avoidance of Pinniped Haul-Out Sites.	The Marine Wildlife Contingency Plan (MWCP) developed and implemented for each survey shall include identification of haul-out sites within or immediately adjacent to the proposed survey area. For surveys within 300 meters (m) of a haul-out site, the MWCP shall further require that: • The survey vessel shall not approach within 91 m of a haul-out site, consistent with National Marine Fisheries Service (NMFS) guidelines; • Survey activity close to haul-out sites shall be conducted in an expedited manner to minimize the potential for disturbance of pinnipeds on land; and • Marine Wildlife Monitors shall monitor pinniped activity onshore as the vessel approaches, observing and reporting on the number of pinnipeds potentially disturbed (e.g., via head lifting, flushing into the water). The purpose of such reporting is to provide CSLC and California Department of Fish and Wildlife (CDFW) with information regarding potential disturbance associated with OGPP surveys.	No adverse effects to pinnipeds at haul outs are observed.	Document pinniped reactions to vessel presence and equipment use. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Monitoring Report following comple-tion of survey.	6/6-10/2014

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
MM BIO-8: Reporting Requirements – Collision.	All State waters; if a collision with marine mammal or reptile occurs, the vessel operator shall document the conditions under which the accident occurred, including the following: • Vessel location (latitude, longitude) when the collision occurred; • Date and time of collision; • Speed and heading of the vessel at the time of collision; • Observation conditions (e.g., wind speed and direction, swell height, visibility in miles or kilometers, and presence of rain or fog) at the time of collision; • Species of marine wildlife contacted (if known); • Whether an observer was monitoring marine wildlife at the time of collision; and, • Name of vessel, vessel owner/operator, and captain officer in charge of the vessel at time of collision. After a collision, the vessel shall stop, if safe to do so; however, the vessel is not obligated to stand by and may proceed after confirming that it will not further damage the animal by doing so. The vessel will then immediately communicate by radio or telephone all details to the vessel's base of operations, and shall immediately report the incident. Consistent with Marine Mammal Protection Act requirements, the vessel's base of operations or, if an onboard telephone is available, the vessel captain him/herself, will then immediately call the National Oceanic and Atmospheric Administration (NOAA) Stranding Coordinator to report the collision and follow any subsequent instructions. From the report, the Stranding Coordinator will coordinate subsequent action, including enlisting the aid of marine mammal rescue organizations, if appropriate. From the vessel's base of operations, a telephone call will be placed to the Stranding Coordinator, NOAA National Marine Fisheries Service (NMFS), Southwest Region, Long Beach, to obtain instructions. Although NOAA has primary responsibility for marine mammals in both State and Federal waters, the California Department of Fish and Wildlife (CDFW) will also be advised that an incident has occurred in State waters affecting a protected species.	No adverse effects to marine mammals or sea turtles due to survey activities are observed.	Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Monitoring Report following comple-tion of survey.	DSD Report Attached

EXHIBIT H

Mitigation Monitoring Program

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
MM BIO-9: Limitations on Survey Operations in Select Marine Protected Areas (MPAs).	All MPAs; prior to commencing survey activities, geophysical operators shall coordinate with the CLSC, California Department of Fish and Wildlife (CDFW), and any other appropriate permitting agency regarding proposed operations within MPAs. The scope and purpose of each survey proposed within a MPA shall be defined by the permit holder, and the applicability of the survey to the allowable MPA activities shall be delineated by the permit holder. If deemed necessary by CDFW, geophysical operators will pursue a scientific collecting permit, or other appropriate authorization, to secure approval to work within a MPA, and shall provide a copy of such authorization to the CSLC as part of the required presurvey notification to CSLC. CSLC, CDFW, and/or other permitting agencies may impose further restrictions on survey activities as conditions of approval.	No adverse effects to MPA resources due to survey activities are observed.	Monitor reactions of wildlife to survey operations; report on shutdown conditions and survey restart. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder; survey permitted by CDFW.	Prior to survey.	5/5/2016
MM HAZ-1: Oil Spill Contingency Plan (OSCP) Required Information.	Permittees shall develop and submit to CSLC staff for review and approval an OSCP that addresses accidental releases of petroleum and/or non-petroleum products during survey operations. Permittees' OSCPs shall include the following information for each vessel to be involved with the survey: • Specific steps to be taken in the event of a spill, including notification names, phone numbers, and locations of: (1) nearby emergency medical facilities, and (2) wildlife rescue/response organizations (e.g., Oiled Wildlife Care Network); • Description of crew training and equipment testing procedures; and • Description, quantities, and location of spill response equipment onboard the vessel.	Reduction in the potential for an accidental spill. Proper and timely response and notification of responsible parties in the event of a spill.	Documentation of proper spill training. Notification of responsible parties in the event of a spill.	OGPP permit holder and contract vessel operator.	Prior to survey.	5/16/2016
MM HAZ-2: Vessel fueling restrictions.	Vessel fueling shall only occur at an approved docking facility. No cross vessel fueling shall be allowed.	Reduction in the potential for an accidental spill.	Documentation of fueling activities.	Contract vessel operator.	Following survey.	
MM HAZ-3: OSCP equipment and supplies.	Onboard spill response equipment and supplies shall be sufficient to contain and recover the worst-case scenario spill of petroleum products as outlined in the OSCP.	Proper and timely response in the event of a spill.	Notification to CSLC of onboard spill response equipment/supplies inventory, verify	Contract vessel operator.	Prior to survey.	5/16/2016

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
			ability to respond to worst-case spill.			
MM HAZ-1: Oil Spill Contingency Plan (OSCP) Required Information.	Outlined under **Hazards and Hazardous Materials** (above)					
MM HAZ-2: Vessel fueling restrictions.	Outlined under **Hazards and Hazardous Materials** (above)					
MM HAZ-3: OSCP equipment and supplies.	Outlined under **Hazards and Hazardous Materials** (above)					
MM BIO-9: Limitations on Survey Operations in Select MPAs.	Outlined under **Biological Resources** (above)					
MM REC-1: U.S. Coast Guard (USCG), Harbormaster, and Dive Shop Operator Notification.	All California waters where recreational diving may occur; as a survey permit condition, the CSLC shall require Permittees to provide the USCG with survey details, including information on vessel types, survey locations, times, contact information, and other details of activities that may pose a hazard to divers so that USCG can include the information in the Local Notice to Mariners, advising vessels to avoid potential hazards near survey areas. Furthermore, at least twenty-one (21) days in advance of in-water activities, Permittees shall: (1) post such notices in the harbormasters' offices of regional harbors; and (2) notify operators of dive shops in coastal locations adjacent to the proposed offshore survey operations.	No adverse effects to recreational divers from survey operations.	Notify the USCG, local harbormasters, and local dive shops of planned survey activity. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Prior to survey.	5/11/2016

EXHIBIT H

Mitigation Monitoring Program

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
MM FISH-1: U.S. Coast Guard (USCG) and Harbormaster Notification.	All California waters; as a survey permit condition, the CSLC shall require Permittees to provide the USCG with survey details, including information on vessel types, survey locations, times, contact information, and other details of activities that may pose a hazard to mariners and fishers so that USCG can include the information in the Local Notice to Mariners, advising vessels to avoid potential hazards near survey areas. Furthermore, at least twenty-one (21) days in advance of in-water activities, Permittees shall post such notices in the harbormasters' offices of regional harbors.	No adverse effects to commercial fishing gear in place.	Notify the USCG and local harbormasters of planned survey activity. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Prior to survey.	5/11/2014 JJS
MM FISH-2: Minimize Interaction with Fishing Gear.	To minimize interaction with fishing gear that may be present within a survey area: (1) the geophysical vessel (or designated vessel) shall traverse the proposed survey corridor prior to commencing survey operations to note and record the presence, type, and location of deployed fishing gear (i.e., buoys); (2) no survey lines within 30 m (100 feet) of observed fishing gear shall be conducted. The survey crew shall not remove or relocate any fishing gear; removal or relocation shall only be accomplished by the owner of the gear upon notification by the survey operator of the potential conflict.	No adverse effects to commercial fishing gear in place.	Visually observe the survey area for commercial fishing gear. Notify the gear owner and request relocation of gear outside survey area. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Immediately prior to survey (prior to each survey day).	6/6-10/2014 JJS
MM FISH-1: USCG and Harbormaster Notification.	Outlined under **Commercial and Recreational Fisheries** (above)					JJS

Acronyms/Abbreviations: CARB = California Air Resources Board; CDFW = California Department of Fish and Wildlife; CSLC = California State Lands Commission; dB = decibels; kHz = kilohertz; MPA = Marine Protected Area; MWCP = Marine Wildlife Contingency Plan; MWM = Marine Wildlife Monitor; m= meter(s); NOAA = National Oceanic and Atmospheric Administration; NO_x = Nitrogen Oxide; OGPP = Offshore Geophysical Permit Program; OSCP = Oil Spill Contingency Plan; USCG = U.S. Coast Guard